CLAIMS

What is claimed is:

1. A method for generating a pulsed excitation function representative of a human vocal tract, comprising:

receiving movement information of at least one tissue type associated with human voicing activity, wherein the movement information comprises position versus time information, wherein the at least one tissue type includes human tissue that vibrates with opening and closing of vocal folds;

generating pressure information using at least one derivative of the movement information;

identifying opening times and closing times of the vocal folds using the pressure information;

constructing the pulsed excitation function by generating a curve including negative amplitude pulses at times corresponding to the closing times and positive amplitude pulses at times corresponding to the opening times; and

adjusting amplitudes and widths of the negative amplitude and positive amplitude pulses to match speech output of the human vocal tract.

2. The method of claim 1, further comprising:

determining parameters of the human vocal tract by applying a simple harmonic oscillator model to the constructed pulsed excitation function, wherein the parameters include mass, elasticity, and damping; and

constructing a model of the human vocal tract using the parameters.

3. The method of claim 1, further comprising determining voiced speech parameters using the constructed pulsed excitation function, wherein the human speech parameters include voiced excitation functions, voicing states, pitch periods, vocal tract transfer functions, and tracheal wall parameters.